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Beyond Admission:

Understanding Pre-College Variables and the Success of At-Risk Students

Abstract

This study examined pre-college variables from an admission-office perspective and the ability of these variables to predict college grade point average (GPA) for students specially admitted into an academic support program for at-risk students. The research was conducted at a private, highly-selective, research university in the southwest United States. The primary determining factors for this special admission program are lower-than-average high school GPA and/or standardized test scores. Pre-college variables that most significantly predicted college GPA were high school GPA, gender of student, and leadership experience prior to applying. Scholastic Aptitude Test (SAT) scores failed to predict success as measured by college GPA.

Beyond Admission

Seventy-five percent of students who drop out of college do so during their first two years, and 57 percent of students leave their first college without graduating (Tinto, 1993). First semester grades (McGrath & Braunstein, 1997) and first year grades (Gifford, Briceño-Perriott, & Mianzo, 2006; Reason, 2003) are significantly linked with retention. Because these grades act as a quantifiable predictor of retention and because grades are associated with academic success, this study focuses on the predicting of first-semester and first-year GPA of at-risk students.

The use of high school GPA and rank is widely accepted as a positive predictor of academic success (Astin, 1997; Hoffman & Lowitzki, 2005; Schwartz & Washington, 2002; Stricker, Rock & Burton, 1996; Ting, 1998; Wolfe & Johnson, 1995). Standardized test scores have also been found as a predictor, although they have been questioned in recent years (Astin, 1997; Lawlor, S., Richman, S. & Richman, C.L., 1997; Naumann, Bandalos & Gutkin, 2003; Reason, 2001; Stricker, et. al, 1996). Student involvement (Astin, 1984) and a variety of emotional and social variables (Boulter, 2002; DeBerard, Spielmans & Julka, 2004; House, Keely & Hurst, 1996; McGrath & Braunstein, 1997;

Ridgell & Lounsbury, 2004; Spitzer, 2000; Wolfe & Johnson, 1995) have also been recently demonstrated as possible predictors of success.

Changes in demographics have altered studies on academic success and retention (Reason, 2001). Much of the research has been based on the traditional view of white, 18- to 22-year-old, full-time students, even though the number of students of color in higher education increased 61 percent between 1984 and 1994 (Pascarella & Terenzini, 1998). These changes have created the necessity for research that understands the new demographics of higher education.

Literature Review

A review of the literature showed that research related to the predicting of academic success determined by GPA in college has been productive in recent years, but not yet progressive. Significant findings have been made using academic-related variables (Lawlor, et. al, 1997; Reason, 2001, 2003; Stricker, et. al, 1996), non-academic variables (DeBerard, et. al, 2004; Naumann, et. al, 2003; Spitzer, 2000) and a combination of both to predict academic success (McGrath & Braunstein, 1997; Ridgell

& Lounsbury, 2004; Schwartz & Washington, 2002; Ting, 1998; Wolfe & Johnson, 1995). Despite these findings, and numerous recommendations, the usage of pre-college variables remains very much the same (Astin, 1975, 1984, 1997; Atkinson, 2001; Cooper, 1999; Fleming & Garcia, 1998; Lawlor, et. al, 1997; Organ, 2001; Pascarella & Terenzini, 1998; Speyer, 2004; Tam & Sukhatme, 2004; Tinto, 1993).

The non-academic related factors primarily researched included emotional health, social health and physical health. A study by DeBerard, Spielmans and Julka (2004) examined 10 variables that encompassed academic factors, social-support, coping methods, and health status. Their findings indicated a correlation with their variables for 56 percent of the variance of first year GPA. Only low high school GPA, however, could be significantly associated with attrition.

Positive predictors of GPA in a study of 355 full-time undergraduates by Spitzer (2000) were academic efficacy, self-regulation and social support. Naumann, Bandalos and Gutkin (2003) examined first-generation college students. In their questionnaire study of 155 students they were able to identify self-regulation as a positive predictor. They also found that ACT scores were positively correlated with the GPA of first-generation students.

Test scores remained under attack. The validity (Speyer, 2004; Ting, 1998), usage (Atkinson, 2001; Cooper, 1999; Reason, 2001; Tam & Sukhatme, 2004) and fairness (Fleming & Garcia, 1998) of standardized test scores, such as the SAT and ACT were being questioned. Cooper (1999) and Reason (2001) examined ways in which adjustments could be made to the scores to accommodate for diversity and differences between high schools.

Reason, who proposed a merit-index score (2001), significantly predicted the academic achievement of white and African-American students with an ACT-based merit-index. Cooper (1999) addressed the "strivers" approach introduced by the Educational Testing Service (ETS). He defined strivers as applicants who exceed the scores of individuals from similar backgrounds by 200 or more points. Comparable to the merit-index approach, the problem with this strategy is that it failed to live up to its goal of offering more opportunities to underrepresented populations. The students who lose spots to strivers were often minority students attending more affluent schools.

Test scores were also used in a 1997 study by Lawlor, Richman and Richman that examined SAT scores as a predictor of achievement for white and black students at Wake Forest University (NC). Their findings showed a strong correlation between the verbal portion of the SAT and GPA for both populations. The math portion of the SAT did not prove to be a predictor. Furthermore, the average total SAT scores for black students in the study was 80 points lower than the average of white students, but there were no differences in GPA between these two populations. This finding indicated a possible bias in the standardized testing.

Of the studies that examined academic and non-academic factors, McGrath and Braunstein (1997) researched coping skills, receptivity to support and initial impressions of students. Their findings indicated that the biggest factors affecting retention were first semester GPA and the students' impressions of other students. Ridgell and Lounsbury (2004) researched general intelligence, personality traits and work drive. General intelligence and work drive proved significant. Extroversion, emotional stability, agreeableness, conscientiousness, and openness to experience, otherwise known as the "big five" personality traits, were not found to be significant predictors.

Schwartz and Washington (2002) focused their study on the academic achievement of African-American freshmen men at a Historically Black College or University (HBCU). Their research found high school GPA and certain non-cognitive variables significant in predicting retention and academic achievement. The significant non-cognitive variables were attachment to the college, academic adjustment and personal-emotional adjustment.

Research by Wolfe and Johnson (1995) examined the high school GPA, SAT score and 32 personality variables of 201 students in an introductory psychology course. High school GPA, with 19 percent of the variance, was identified as the most significant predictor. Self-control, with nine percent of the variance, came second and was followed by SAT score with five percent.

In a study of 54 students by Ting (1998), ACT score was found not to be a predictor of first-year grades and academic progress. High school rank and successful leadership experience proved to be the most effective predictors. The examination of leadership experience as a predictive variable did not turn up in any of the other studies.

Methodology

Design

With permission from the Institutional Review Board of the home university, this study examined the application materials of more than 900 students who entered the university through a special admission program designed to assist students determined by the admission office as being academically at-risk. This determination was based on lower high school GPA and standardized test scores than the regularly admitted school population. Students admitted into this program receive additional support and were required to take a first-year course focused on time management, college study strategies and educational psychology. Surveys were not needed for this study because the data was already available.

Pre-college information for the students in the study was obtained through admission application materials and internal office adjustments. Choosing this viewpoint made the perspective of an admission counselor possible. The high school GPA of students used for this study was adjusted by the office of admission. High schools are increasingly not providing class rankings (Ehrenberg, 2005), so institutions often independently weight and adjust high school GPA to fairly compare applicants.

The students whose files were examined entered the university as early as the fall semester of 1999 and as late as the fall semester of 2003. Nearly one-third of the students examined were student athletes and were excluded from the study because this group primarily received academic and social support from the department of athletics. This exclusion brought the population to 591 students with the opportunity of at least three academic semesters of study.

Participants

The students selected represented an accessible, ethnically diverse, at-risk population. Their composition consisted of 39.8 percent white/Caucasian students, 20.5 percent black/African American, 8.8 percent Asian/Pacific Islander, 19.6 percent Hispanic or Mexican, 0.7 percent Native American, and 10.7 percent mixed/other. These students arrived with an average high school GPA of 3.36 and SAT of 1076. Although these numbers are respectable, they were below the overall student averages at the university, thus classifying the population as academically at-risk. For instance, the fall 2004 entering freshman class at the university averaged a 4.09 GPA and middle 50 percent SAT range of 1310–1460.

Retention of these students for their second year was high (96.3 percent) and differentiated only slightly when considering ethnicity, first-generation status, high school GPA, and test scores. The retention rate for the university as a whole remained between 94 percent and 96 percent during common years. These commonalities provided another reason for this study to remain primarily focused on academic achievement determined by university GPA. (When it comes to the retention of at-risk students future studies might want to explore socioeconomic status, as well rising tuition and distance from home. Perhaps at-risk students with low college GPA are more likely to be retained when they can afford to continue.)

Many of the students in this program were selected because of unique characteristics that make them more desirable and worthy of admission. Many had non-quantifiable talents and abilities associated with music, theatre, art, engineering, business, and architecture. Many were also from diverse backgrounds or offer unique perspectives that make them attractive to the school, despite lower high school GPA or test scores.

Measures

The primary non-cognitive characteristics identified for this study included entry age, gender, ethnicity, first-generation status, reported presence of a language spoken in the home other than English, and reported leadership experience. Cognitive variables obtained from admission information included high school GPA and SAT scores. The academic data gathered included enrollment status, first-year GPA, first-semester GPA, cumulative GPA, and retention for the second year.

Leadership experience was defined as being peer related. Individuals who were members of clubs and organizations

were not classified as leaders unless they held a position clearly associated with leadership experience. Such positions included: president, vice president, chair, vice-chair, captain, co-captain, founder, or any other justly determined leadership position. Of the 591 students, 287 had leadership experience and 304 did not.

Entry age remained consistent across groups for this population primarily because the program is designed for first-time freshmen. For this measurement, birth dates and entry dates were attached values according to their time of the year. For example, June received a value of .5 because it is the sixth month of 12. Fall cohorts received an entry value of .67 because school began during August, the eighth month of 12. Entry age was then calculated by subtracting the birth date from the entry date. This allowed for a more accurate determination of entry age.

Students entering this program averaged 18.45 years. This number did not vary much with black/African American students averaging 18.26 years of age, white/Caucasian students averaging 18.6, and all others falling within this range. For the entire population, the youngest student entered at 16.67 and the oldest at 22.17.

Of the 591 students, the breakdown by gender included 55.8 percent females and 44.2 percent males. This ratio remained relatively consistent for different ethnicities also, with females consistently making up the majority. In measuring language, 37.2 percent reported having a language spoken in the home other than English. Leadership experience was identified for 48.6 percent. As previously mentioned, average adjusted high school GPA was 3.36 and the population had an SAT average of 1076.

When it came to succeeding academically in college, first-year GPA averaged 2.81 and first-semester GPA 2.85. The university average for students during the years examined ranged from 3.08 to 3.20 for both first-semester and first-year GPA. Although this at-risk population did not perform as well as their regularly admitted counterparts, they did seem to bridge the gap when considering the differences between average high school GPA and standardized test scores.

Results

Three variables in this study emerged as significant predictors of academic success. High school GPA, gender and leadership experience proved to be positive correlates at the .01 level as predictors of first-semester GPA and first-year GPA. (See Table 4.) The significance for high school GPA is visible when grouping the GPA and using a one-way ANOVA the resulting first-semester GPA and first-year GPA demonstrated the significance. Also see table one for additional results for high school GPA.

Females outperformed males significantly when it came to first-semester GPA and first-year GPA when running a one-way ANOVA. The difference between high school GPA and SAT scores for females and males should also be noted. Females averaged a 3.42 high school GPA and 1059 SAT. Males averaged a 3.29 high

**Table 1
(High School GPA)**

HS GPA	SAT	College GPA	
By range	Average	1st Semester	1st Year
2.5-2.99	1112	2.68	2.66
3.0-3.49	1091	2.83	2.78
3.5-3.99	1041	2.94	2.88
4.0 or better	1046	3.00	3.02

Table 2 (Gender of Student)

Gender	SAT	HS GPA	College GPA	
	Average	Average	1st Semester	1st Year
Male	1098	3.29	2.74	2.69
Female	1059	3.42	2.94	2.90

Table 3 (Leadership Experience (LE))

LE	SAT	HS GPA	College GPA	
	Average	Average	1st Semester	1st Year
Yes	1069	3.40	2.94	2.90
No	1083	3.33	2.77	2.73

school GPA and 1098 SAT. It is unclear whether these differences impacted the results, although it could be argued that females within this population outperformed males because of their slightly better high school GPA. (See Table 2 for more information.)

Students with pre-college leadership experience performed better when it came to first-semester GPA and first-year GPA. A one-way ANOVA shows the significance for first-semester GPA and first-year GPA. (For results, see Table 3.) Students with pre-college leadership experience tended to have similar SAT scores, 1069 to 1083, and high school GPA, 3.40 to 3.33, to those without this characteristic. The similar high school GPA and test scores amongst those with and without leadership experience provides further evidence for the variables ability to predict college GPA.

Discussion

The results of this study confirmed research regarding high school GPA as a successful significant positive predictor (Astin, 1997; Hoffman & Lowitzki, 2005; Schwartz & Washington, 2002; Ting, 1998; Wolfe & Johnson, 1995). This study, investigating a similar population, also legitimizes the work of Tobey (1997) in showing the significance of high school GPA as a positive predictor of academic success for at-risk students. The work of Ting (1998) is also validated through the significant use of leadership experience as a predictor. These findings also confirm the need for changes in how SAT scores are valued (Atkinson, 2001; Cooper, 1999; Fleming & Garcia, 1998; Reason, 2001, 2003; Speyer, 2004; Stricker, 1996).

The ability to generalize the findings of this study were limited due to the specificity of the college and special admission program. The presence of students in the study entering the university during a period of different years might also draw questions.

The findings, however, are unique in examining pre-college factors from an admission perspective and the resulting college GPA.

Students considered for this special admission program often had lower-than-average high school GPA or SAT scores. If a student with a high GPA was admitted, then it usually meant they had a low SAT, or vice versa. This study shows that when admitting students with low high school GPA or low SAT scores it is more accurate to admit based on high school GPA to predict success.

Conclusion

By identifying leadership experience, high school GPA and gender as positive predictors of academic achievement this study adds to the literature and provides further questioning as to the heavy usage of SAT scores. Logical reasons can be found for why leadership experience is able to predict academic achievement at both high school and college. Leadership ability can be attached to work drive, self-regulation and other desirable personality characteristics. This finding satisfies higher education administrators search for additional effective pre-college predictors of success (Gifford, et al, 2006). Higher education greatly over-emphasizes certain characteristics, such as SAT scores. Placing more of an emphasis on other characteristics, such as pre-college leadership experience, might be more beneficial when it comes to admitting students and ranking institutions.

Astin (1997) claimed that high school GPA, test scores, gender, and race accounted for the majority of variation in retention. Changing demographics have blurred race, ethnicity and culture (Pascarella & Terenzini, 1998; Reason, 2003), and higher education must now look deeper into the true nature of applicants when deciding admission. Test scores are also under scrutiny (Atkinson, 2001; Fleming & Garcia, 1998; Speyer, 2004) and there are recommendations (Cooper, 1999; Reason, 2001, 2003; Stricker, 1996) as to how they should be reconsidered. The findings in this study encourage the development of a value system that more accurately admits, predicts and ranks success.

Recommendations

Higher education administrators need to reevaluate the magnitude of pre-college variables, especially when deciding which students are admitted and/or determined to be at-risk, and ask themselves if SAT scores are used so heavily in the college admission process because they are predictors of academic success, or (Ehrenberg, 2005) because they are linked with the college ranking systems? As race and affirmative action policies become increasingly questioned, alternative approaches that value individuals from diverse backgrounds must be considered—an increase in the value of other variables can make possible a more accurate prediction of success. This study recommends questioning the weight assigned to test scores (such as the SAT) when considering the selectivity of a university. Changes could place a more desirable value on more predictive characteristics, while also symbolizing an honest commitment from higher education on searching for qualities in demand.

Table 4 (Correlations)

		Gender	Leadership	Adjusted HS GPA	SAT Score	First Semester GPA	First Year GPA
Gender	Pearson Correlation	1	.080	.157(**)	-.214(**)	.157(**)	.189(**)
	Sig. (2-tailed)		.052	.000	.000	.000	.000
	N	591	591	591	591	591	591
Leadership	Pearson Correlation	.080	1	.086(*)	-.078	.132(**)	.153(**)
	Sig. (2-tailed)	.052		.037	.059	.001	.000
	N	591	591	591	591	591	591
Adjusted HS GPA	Pearson Correlation	.157(**)	.086(*)	1	-.285(**)	.182(**)	.198(**)
	Sig. (2-tailed)	.000	.037		.000	.000	.000
	N	591	591	591	591	591	591
SAT score	Pearson Correlation	-.214(**)	-.078	-.285(**)	1	-.036	-.024
	Sig. (2-tailed)	.000	.059	.000		.388	.554
	N	591	591	591	591	591	591
First Semester GPA	Pearson Correlation	.157(**)	.132(**)	.182(**)	-.036	1	.866(**)
	Sig. (2-tailed)	.000	.001	.000	.388		.000
	N	591	591	591	591	591	591
First Year GPA	Pearson Correlation	.189(**)	.153(**)	.198(**)	-.024	.866(**)	1
	Sig. (2-tailed)	.000	.000	.000	.554	.000	
	N	591	591	591	591	591	591

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

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